

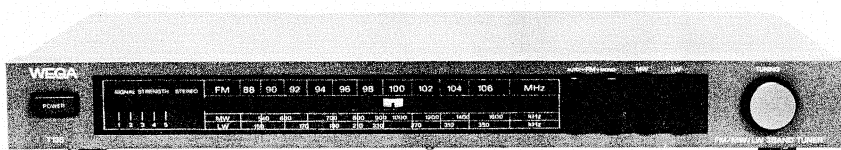
# WEGA

## FM/MW/LW 3BAND TUNER

## T135

### Service Manual

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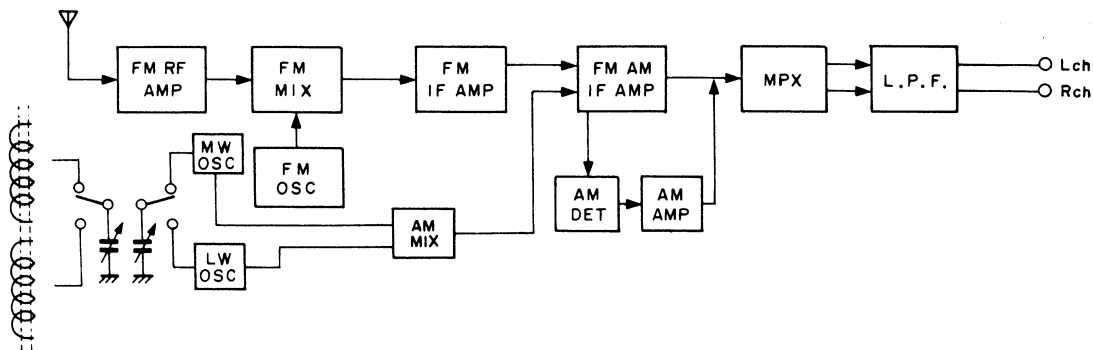


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## SECTION 1 OUTLINE

Block Diagram



## SPECIFICATIONS

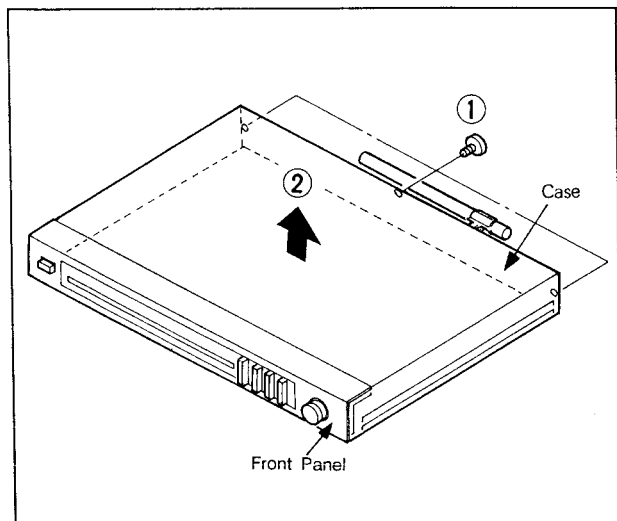
Tuning Range	FM	87.5 – 106 MHz
	MW	520 – 1605 kHz
	LW	150 – 350 kHz
Usable Sensitivity	FM	1.25 $\mu$ V (S/N = 26 dB 40 kHz Mod.)
	MW	250 $\mu$ V/m with ferrite bar antenna
	LW	500 $\mu$ V/m with ferrite bar antenna
Signal to Noise Ratio	FM	70 dB (Mono)
	MW	50 dB (50 mV/m)
	LW	50 dB (50 mV/m)
Selectivity	FM	66 dB (300 kHz)
	MW	33 dB (9 kHz)
	LW	33 dB (9 kHz)
Distortion	FM	0.3% (Mono), 0.6% (Stereo)
	MW	0.4 %
	LW	0.5%
Stereo Separation	FM	40 dB (1 kHz)
Power Supply		220V/50 Hz
Power Consumption		15 W
Dimensions (W x H x D)		430 x 45 x 295 mm
Weight		3.4 kg

## SECTION 2 DISASSEMBLY

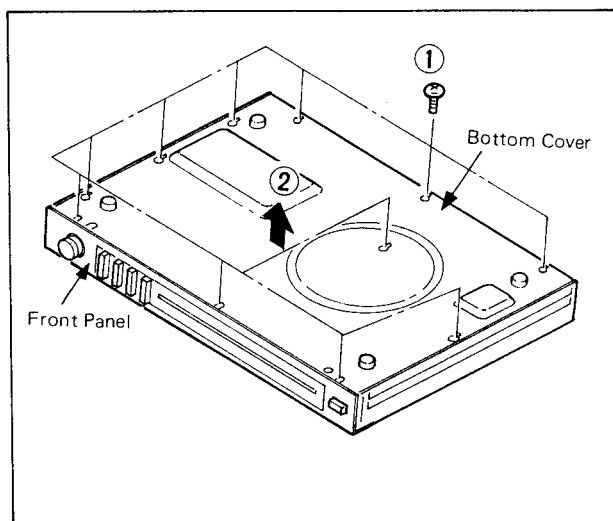
### 2-1: Removal

Follow the disassembly procedure in the numerical order given.

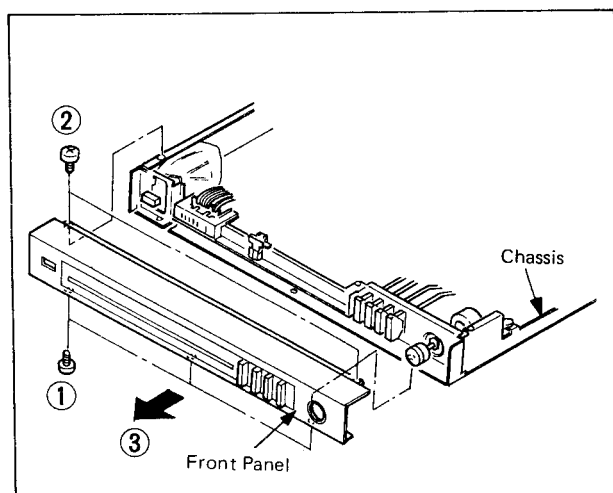
#### a. Case Removal



#### b. Bottom Cover Removal

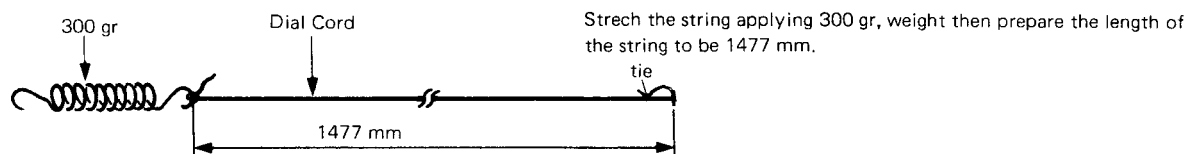


#### c. Front Panel Removal



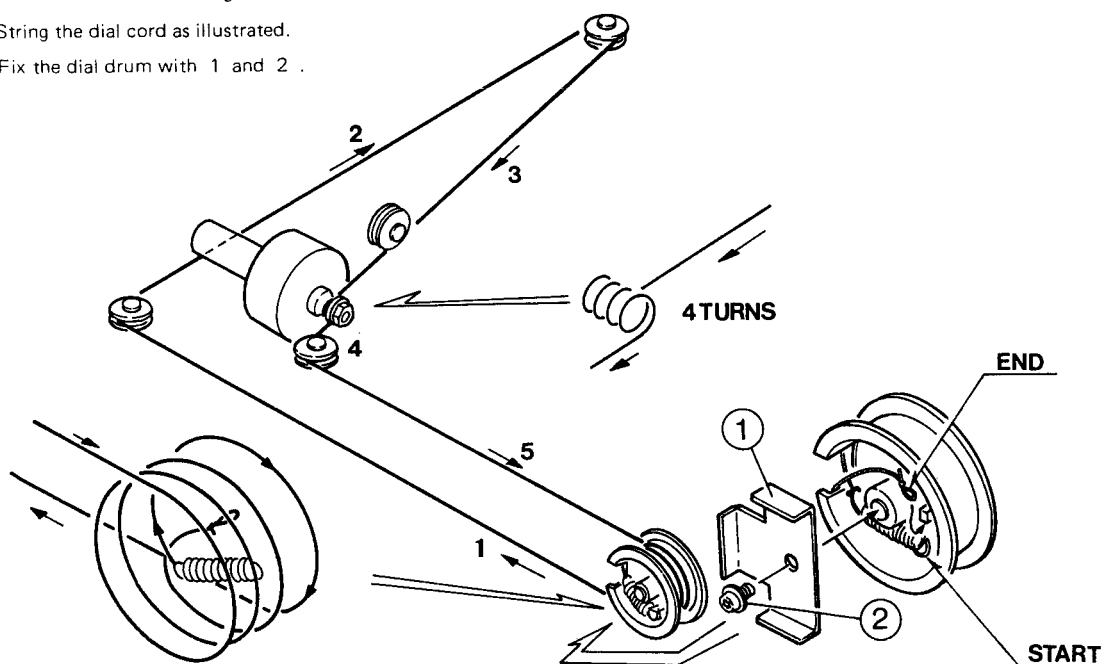
## 2-2: Dial Cord Stringing

### 1. Preparation



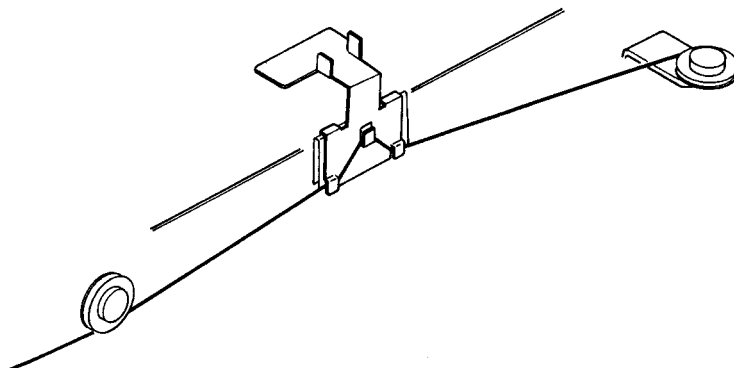
### 2. Stringing

1. Turn the tuning capacitor fully minimum frequency.
2. Set the dial drum to tuning capacitor.
3. String the dial cord as illustrated.
4. Fix the dial drum with 1 and 2.



### 3. Dial pointer installation

1. Adjust the position of the dial pointer by receiving a known station.
2. Apply a drop of contact cement to the dial pointer.





### SECTION 3 ELECTRICAL ADJUSTMENT

**Equipment Needed:**

- |                               |                           |                            |
|-------------------------------|---------------------------|----------------------------|
| 1. AM Signal Generator        | 4. Oscilloscope           | 7. Distortion Meter        |
| 2. FM Signal Generator        | 5. Output Meter (AC VTVM) | 8. Load Resistor (47K Ohm) |
| 3. FM Stereo Signal Generator | 6. Frequency Counter      | 9. Center Meter            |

**Important Notes:**

- |   |  |
|---|--|
| 1. Use only nonmetallic alignment tools to ensure proper alignment.               | 3. Apply 1000 Hz modulation to signal generator at 30% modulation ( $\pm 22.5$ kHz deviation for FM) except where noted. |
| 2. Keep signal generator output signal as low as possible to prevent overloading. |  |

**3-1 MW Adjustment** (Function Selector Switch set to MW.)

Step	AM Generator		Dial Setting	AC VTVM and Oscilloscope	Adjust	Indication
	Connection	Frequency				
1	To Standard Radiating Loop or a short piece of copper wire placed near Antenna	450KHz	Low end of dial	Connect OUTPUT	CFU101 T103	Maximum Audio Output
2		510KHz	Extreme low end of dial. Tuning gang fully closed.		MWOSC,coil L108	
3		1640KHz	Extreme high end of dial. Tuning gang fully opened.		MW OSC,trimmer CT105	
4	Modulation 1KHz at 30%	600KHz	Tune to Generator Signal		Antenna coil (L110-1) on back of set. Repeat step 4 & 5 until maximum output is achieved.	
5		1400KHz	Tune to Generator Signal		MW RF trimmer CT104	

**3-2 LW Adjustment** (Function Selector Switch set to LW)

Step	AM Generator		Dial Setting	AC VTVM and Oscilloscope	Adjust	Indication
	Connection	Frequency				
1	To Standard Radiating Loop or a short piece of copper wire placed near Antenna	145KHz	Extreme low end of dial. Tuning gang fully closed.	Connect OUTPUT	LW OSC,coil L109	Maximum Audio Output
2		366KHz	Extreme high end of dial. Tuning gang fully opened.		LW OSC,trimmer CT107	
3		150KHz	Tune to Generator Signal		Antenna coil (L101-3) on back of set. Repeat steps 3 & 4 until maximum output is achieved.	
4	Modulation 1KHz at 30%	340KHz	Tune to Generator Signal		LW RF trimmer CT106	

**3-3 FM Adjustment** (Function Selector Switch set to FM MONO.)

Step	Signal Generator		Dial Setting	Indicator	Adjust	Indication
	Connection	Frequency				
1	FM Generator connected by two 50 Ohm carbon resistors with lead to antenna terminals	No signal	Medium of dial	AC VTVM & Oscilloscope Connected to OUTPUT	T101	Maximum noise output
2		87.4MHz	Extreme low end of dial. Tuning gang fully closed.		FM Osc. coil L105	Maximum Audio output
3		107MHz	Extreme high end of dial. Tuning gang fully opened.		OSC trimmer CT103 Repeat steps 2 & 3 until correct FM calibration is achieved.	
4		88MHz	Tune to Generator Signal		FM RF coils L101, L103	
5		106MHz	Tune to Generator Signal		FM RF trimmers CT101, CT102 Repeat steps 4 & 5 until maximum output is achieved.	

# T135

Step	Signal Generator		Dial Setting	Indicator	Adjust	Indication
	Connection	Frequency				
6		No Signal	Medium of dial	Connect FM Center Meter to test points TP1 & TP2	T102 (primary, YEL)	Center meter pointer to exact center of scale.
7		98MHz	Tune to Generator Singal (Set to read 2mV)	Connect AC VTVM & Oscilloscope & Distortion meter to OUTPUT	T102 (Secondary, BLK) Repeat steps 6 & 7 until minimum distortion is obtained with the center meter pointer in its exact center of scale.	Minimum audio output distortion

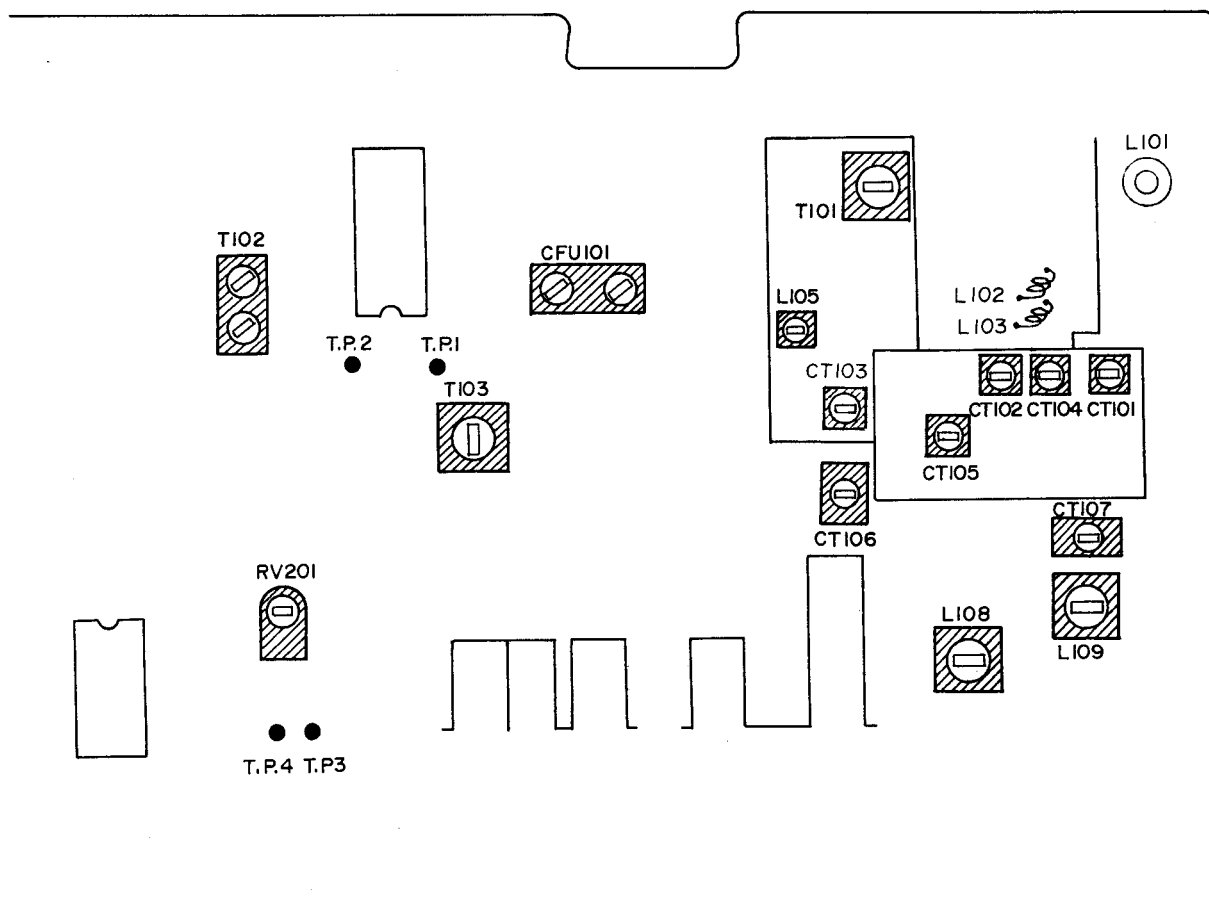
## 3-4 FM MPX Adjustment

Notes:

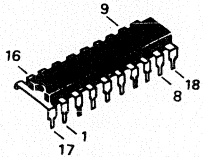
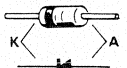
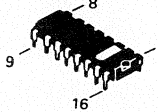
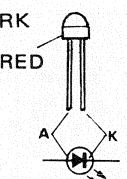
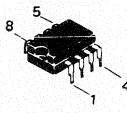
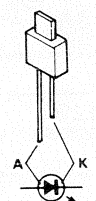
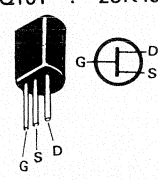

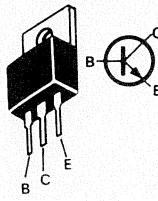
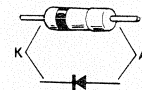
- Carefully follow the manufacturer's instructions for the FM stereo signal generator being used to obtain standard stereo composite output signal.
- If FM stereo generator is equipped with an RF signal output, set frequency deviation meter to  $\pm 45$  KHz or use stereo generator composite output and externally modulated FM signal generator for  $\pm 45$  KHz frequency deviation.

Step	FM Stereo Generator RF Signal Output		Dial Setting	Selector Switch	Oscilloscope & AC VTVM	Adjust	Indication
	Connection	Frequency					
1	No Signal		Point of no interference	FM	Connect frequency counter to TP3 & TP4	RV201	76.000 Hz

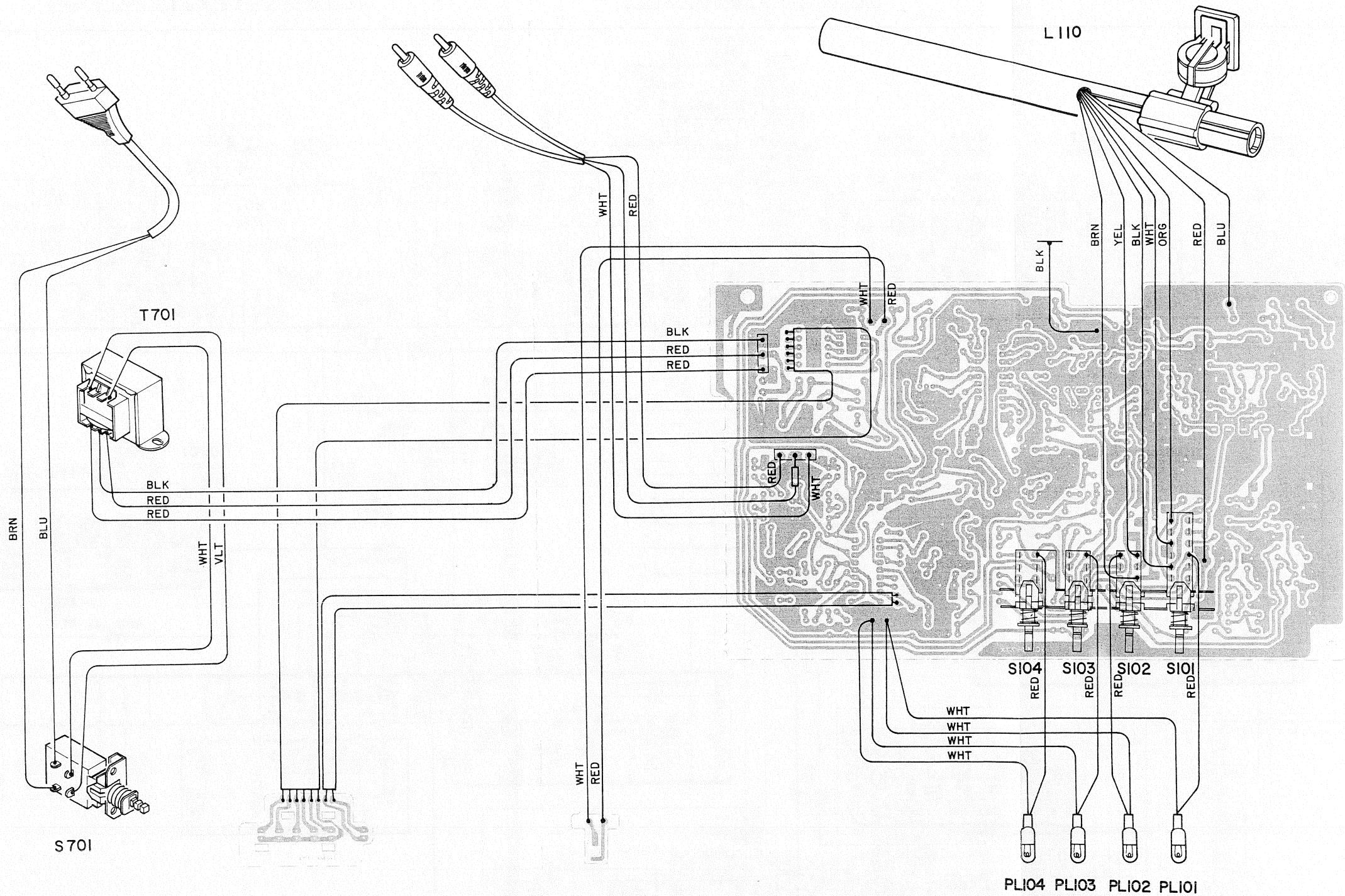
## 3-5 Adjustments Parts Location



4-1: Replacement Semiconductors

<p>IC101 : HA11211</p> 	<p>D101 - 107, 112 : DS448</p> <p>D301 : GZA12U</p> 
<p>IC201 : HA12016</p> 	<p>D207 SLP102A</p> <p>ANODE MARK</p> <p>RED</p> 
<p>IC202 : TL489CP</p> 	<p>D206 : SLP151D</p> <p>D201 - 205 : SLP251D</p> 
<p>Q101 : 2SK49H</p> 	
<p>Q102, 103, 105 } 2SC930D</p> <p>Q108, 111 } 2SC536G</p> <p>Q106, 107, 109 } 2SC536G</p> <p>Q201, 202 } 2SC536G</p> <p>Q112 : 2SA608E</p> 	
<p>Q301 : 2SD325E</p> 	
<p>D108 ~ 110 : 1S188FM</p> 	

4-2: Wiring Diagram



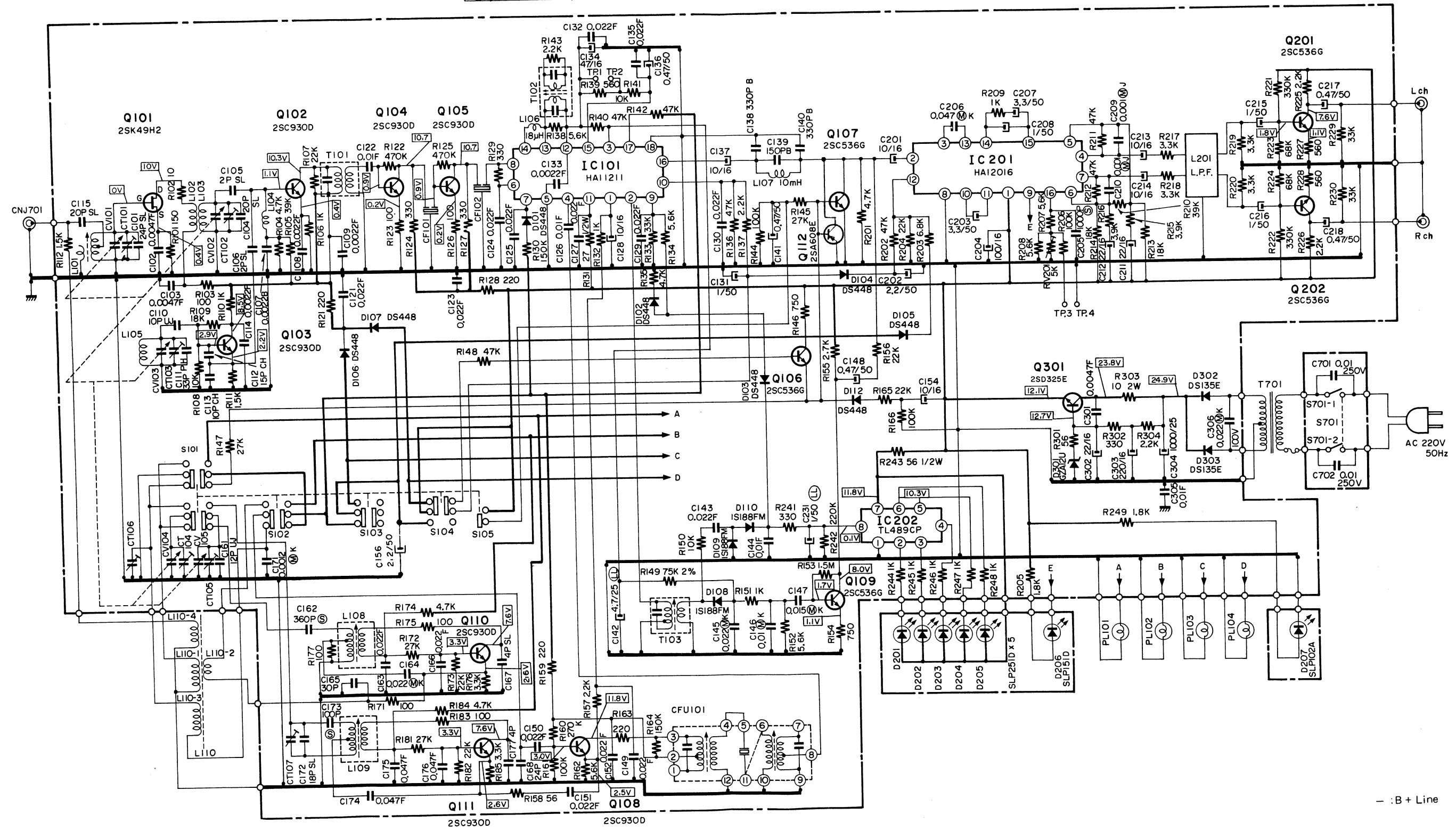
4-3: Schematic Diagram

HA11211 TERMINAL VOLTAGE UNIT:V

	FM	MW	LW		FM	MW	LW		FM	MW	LW
①	2.5	2.5	2.8	⑧	2.0	2.6	2.6	⑮	5.0	6.3	6.3
②	0	0	0	⑨	0.1	0	0	⑯	5.5	5.6	5.6
③	3.5	3.4	3.3	⑩	4.9	5.2	5.2	⑰	1.2	1.9	1.9
④	0.7	0.7	0.7	⑪	11.3	11.3	11.3				
⑤	0	0	0	⑫	5.6	5.6	5.6				
⑥	2.0	2.6	2.6	⑬	5.6	5.6	5.6				
⑦	2.0	2.4	2.9	⑭	5.6	5.6	5.6				

HA12016 TERMINAL VOLTAGE UNIT:V

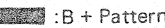
	FM	FM	MW	LW		FM	FM	MW	LW		FM	FM	MW	LW
①	12.1	12.1	12.1	12.1	⑧	0	0	0	0	⑮	2.5	2.5	2.5	2.5
②	3.7	3.7	3.7	3.7	⑨	10.5	10.5	10.5	10.5	⑯	3.0	3.0	3.0	3.0
③	5.3	5.3	5.3	5.3	⑩	2.5	2.5	2.5	2.5					
④	5.6	5.6	5.6	5.6	⑪	2.5	2.5	2.5	2.5					
⑤	10.3	10.3	10.3	10.3	⑫	1.2	1.2	1.2	1.2					
⑥	10.3	10.3	10.3	10.3	⑬	2.5	2.5	2.5	2.5					
⑦	5.7	5.7	5.7	5.7	⑭	2.5	2.5	2.5	2.5					



- :B + Line



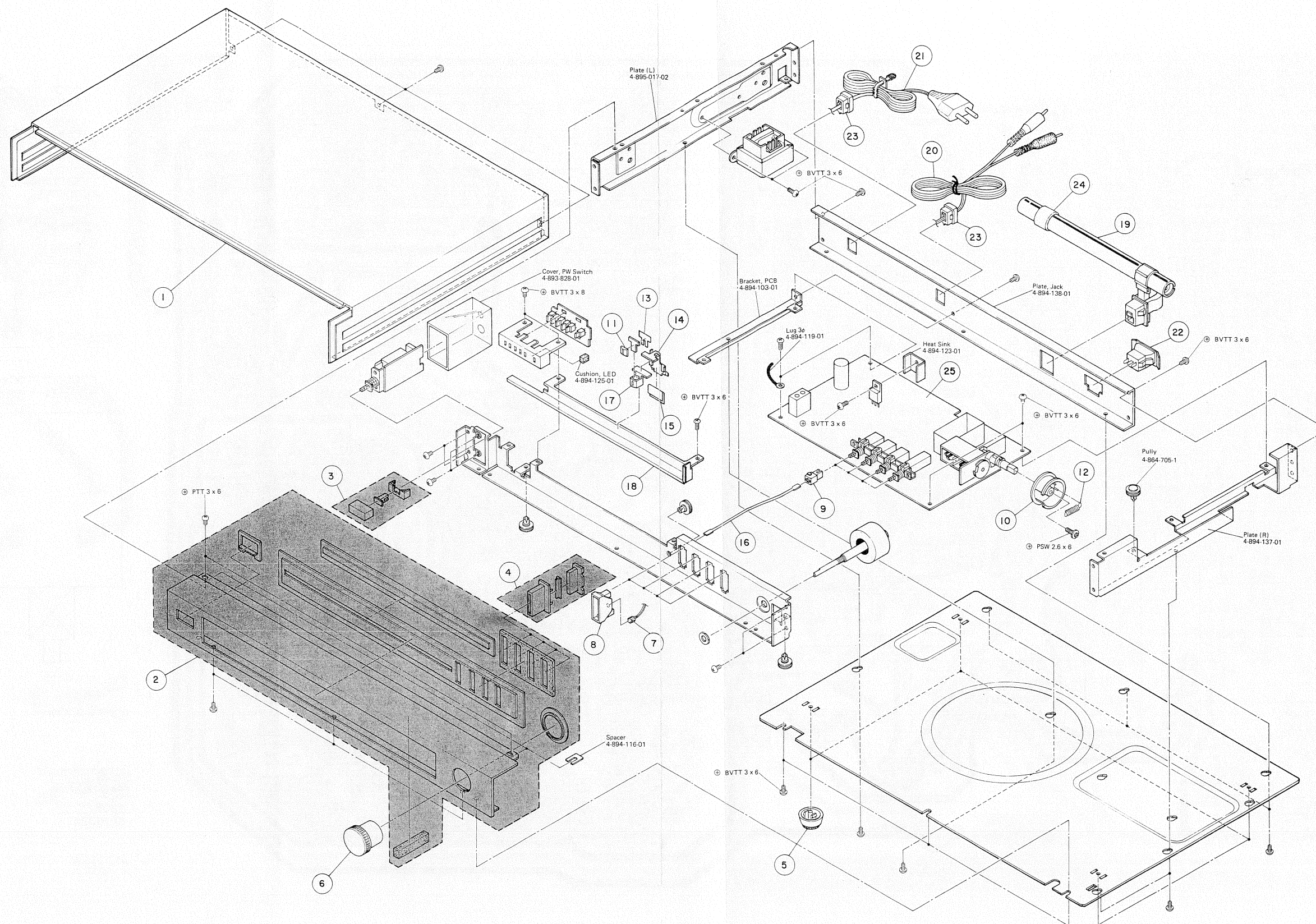
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## SECTION 5 EXPLODED VIEW

**T-135**



## Parts List – Cabinet –

Illus. No.	Parts No.	Parts Name
1	4-894-141-01	Case
2	A-4322-403-A	Panel Ass'y with Escutcheon, power knob Cushion A Cushion, panel Escutcheon, knob Panel, transparent Panel Escutcheon, dial
3	A-4490-110-A	Knob Ass'y, power
4	A-4490-111-A	Knob Ass'y, band
5	X-3701-069-1	Foot Ass'y M.F.
6	X-4894-102-1	Knob Ass'y, (R), 24 $\phi$
7	3-531-038-01	Bushing Rubber
8	4-893-801-01	Cover, lamp
9	4-893-816-01	Jointer
10	4-894-101-01	Drum
11	4-894-102-01	Indicator, pointer
12	4-894-107-01	Spring, coil SUS304-WPB
13	4-894-108-01	Insulator
14	4-894-109-01	Bracket, sliding
15	4-894-110-01	Paper, sliding
16	4-894-111-01	Jointer
17	4-894-130-01	Pointer, dial
18	4-894-131-01	Plate, back
19	1-401-948-11	Bar Antenna
20	1-551-629-11	Cord, with plug
21	1-551-958-11	Cord, power
22	1-561-801-11	Socket, connector
23	3-703-244-02	Bushing, cord
24	4-894-126-01	Cushion, (ANT)
25	A-4335-196-A	PC Board Ass'y main

## ACCESSORIES AND PACKING MATERIALS

Parts No.	Description
3-701-630-01	Poly Bag, unit
3-783-677-01	Instruction Manual
4-875-040-01	Sheet, Protection
4-894-114-01	Sheet, Protection
4-894-114-01	Individual Carton
4-894-139-01	Cushion, forming

## SECTION 6 PARTS LIST

### (1) Electrical Parts List

Ref. No.	Parts No.	Description
<b>SEMICONDUCTORS</b>		
— ICs —		
IC101	8-759-312-11	HA11211
IC201	1-806-067-11	HA12016
IC202	8-759-904-89	TL489CP
— Transistors —		
Q101	1-806-330-11	2SK49H (FET)
Q102, 103 104, 105 108, 110 111	8-729-803-34	2SC930D-NP
Q106, 107 109, 201 202	1-800-830-11	2SC536-G
Q112	8-729-860-82	2SA608SP-E
Q301	1-806-334-31	2SD325-E
— Diodes —		
D101, 102 103, 104 105, 106 107, 112	1-806-268-11	DS448
D108, 109 110	8-719-296-11	1T261
D201, 202 203, 204 205	8-719-902-52	SLP251D
D206	1-806-332-11	SLP151D (LED)
D207	1-806-331-11	SLP102A (LED)
D301	8-719-113-21	RD13E-B1Z8
D302, 303	1-806-267-11	DS135E
<b>TRANS., COILS &amp; FILTERS</b>		
L101	1-459-380-11	Coil, VHF, FM ANT.
L102, 103	1-422-059-11	Coil, VHF FM, RF
L104	1-420-840-11	Coil, FM ANT.
L105	1-459-381-11	Coil, VHF, FM, OSC
L106	1-408-589-11	18.00UH, micro inductor
L107	1-408-219-11	10MMH, micro inductor
L108	1-405-991-11	OSC, Coil LE
L109	1-405-990-11	OSC, Coil
L201	1-231-589-11	Filter, low pass
T101	1-404-360-11	Trans. MW
T102	1-404-157-11	Trans. FM disc.
T103	1-404-359-11	IFT 455 kHz
T107	1-447-212-11	Trans. , power
CF101, 102	1-527-878-11	Filter, ceramic 10.7 MHz
CFU101	1-404-254-11	CFU, Triple tuning

Ref. No.	Parts No.	Description
<b>RESISTORS</b>		
<i>All Resistors are in <math>\Omega</math>. Common 1/4W Carbon Resistors are omitted. Refer to the list on Page 20 for their part numbers.</i>		
RV201	1-226-235-11	5K $\Omega$
<b>CAPACITORS</b>		
<i>All Capacitors are in <math>\mu</math>F and Ceramic unless otherwise noted. 50WV or less are not indicated excepted for electrolytics. Common Capacitors are omitted. Refer to the lists on Page 17 and 18 for their Part No.</i>		
C136, 141 148, 155 217, 218	1-123-351-11	0.47 , 50V
C138, 140	1-102-112-21	330PF, 50V
C139	1-102-108-21	150PF, 50V
C156, 202	1-123-353-11	2.2 , 50V
C204	1-123-320-11	100 , 16V
C211, 212 302	1-123-317-11	22 , 16V
C303	1-123-321-11	220 , 16V
C304	1-123-337-11	1000 , 25V
C701, 702	1-130-455-11	0.01 , 250V film
CT103	1-141-138-11	
CT106	1-141-171-12	
CT107	1-141-097-31	
CV101	1-151-398-11	
<b>MISCELLANEOUS</b>		
S101	1-553-980-11	Switch, push, 4 rey
S701	1-553-834-11	Switch, power
	4-894-129-01	Holder, LED
	X-4864-705-1	Pulley, Ass'y
	X-4894-101-1	Tuning Shaft Ass'y
PL101, 102, 103, 104	1-518-484-11	Pilot lamp



## (2) Electrical Parts List – Common. –

**ELECTROLYTIC CAPACITORS**

Note: Circled letter (A to Z) are applicable to European models only.

CAP. (μF)	RATING → : Use the high voltage rated one.					
	6.3 VOLT.	10 VOLT.	16 VOLT.	25 VOLT.	35 VOLT.	50 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.47						1-121-726-00 (A)
1.0						1-121-391-00 (A)
2.2						1-121-450-00 (A)
3.3	→	→	→	1-121-392-00 (A)	→	1-121-393-00 (A)
4.7	→	→	→	1-121-395-00 (A)	→	1-121-396-00 (A)
10	→	→	1-121-651-00 (A)	1-121-398-00 (A)	→	1-121-738-00 (A)
22	→	→	1-121-479-00 (A)	1-121-480-00 (A)	1-121-662-00 (A)	1-121-152-00 (A)
33	→	→	1-121-403-00 (A)	1-121-404-00 (A)	1-121-652-00 (B)	1-121-405-00 (A)
47	→	1-121-352-00 (A)	1-121-409-00 (A)	1-121-410-00 (A)	1-121-653-00 (B)	1-121-411-00 (A)
100	→	1-121-414-00 (A)	1-121-415-00 (A)	1-121-416-00 (A)	1-121-357-00 (B)	1-121-417-00 (B)
220	1-121-419-00 (B)	1-121-420-00 (B)	1-121-421-00 (A)	1-121-422-00 (B)	1-121-261-00 (C)	1-121-423-00 (B)
330	1-121-751-00 (B)	1-121-805-00 (B)	1-121-521-00 (C)	1-121-654-00 (B)	1-121-655-00 (D)	1-121-656-00 (C)
470	1-121-424-00 (B)	1-121-425-00 (C)	1-121-426-00 (C)	1-121-733-00 (B)	1-121-361-00 (E)	1-121-810-00 (D)
1000	→	1-121-736-00 (C)	1-121-245-00 (D)	1-121-657-00 (D)	1-121-388-00 (E)	1-123-061-00 (F)
2200	1-121-658-00 (B)	1-121-659-00 (C)	1-121-660-00 (D)	1-123-067-00 (F)	1-121-984-00 (F)	→
3300	1-121-661-00 (D)	1-123-075-00 (E)	1-123-071-00 (F)	→	→	→

CAP. (μF)	100 VOLT.	160 VOLT.	250 VOLT.	350 VOLT.
	PART No.	PART No.	PART No.	PART No.
0.47	→	→	→	→
1.0	1-123-249-00 (A)	1-123-252-00 (A)	1-123-003-00 (B)	1-121-168-00 (B)
2.2	1-123-250-00 (A)	1-123-026-00 (B)	→	1-123-028-00 (B)
3.3	1-121-995-00 (A)	→	1-123-004-00 (B)	1-123-006-00 (C)
4.7	1-123-255-00 (A)	1-121-246-00 (B)	1-121-759-00 (B)	1-123-007-00 (D)
10	1-121-126-00 (B)	1-121-999-00 (B)	1-123-254-00 (C)	1-123-008-00 (D)
22	1-121-996-00 (C)	1-123-253-00 (C)	1-123-005-00 (D)	1-123-022-00 (D)
33	1-121-997-00 (C)	1-121-757-00 (C)	→	→
47	1-123-251-00 (C)	1-121-919-00 (C)	→	→
100	1-123-084-00 (E)	→	→	→

**CERAMIC CAPACITORS (A)**

CAP. (pF)	RATING					
	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (pF)	50 VOLT.	CAP. (μF)
	PART No.		PART No.		PART No.	
0.5	1-101-837-00	22	1-102-959-00	150	1-101-361-00	0.001
0.75	1-101-586-00	24	1-102-960-00	160	1-101-367-00	0.0012
1.0	1-102-934-00	27	1-102-961-00	180	1-102-976-00	0.0015
1.5	1-101-576-00	30	1-102-962-00	200	1-102-977-00	0.0018
2.0	1-102-935-00	33	1-102-963-00	220	1-102-978-00	0.0022
3	1-102-936-00	36	1-102-964-00	240	1-102-979-00	0.0027
4	1-102-937-00	39	1-102-965-00	270	1-102-980-00	0.0033
5	1-102-942-00	43	1-102-966-00	300	1-102-981-00	0.0039
6	1-102-943-00	47	1-101-880-00	330	1-102-820-00	0.0047
7	1-102-944-00	51	1-101-882-00	360	1-102-821-00	0.0056
8	1-102-945-00	56	1-101-884-00	390	1-102-822-00	0.0068
9	1-102-946-00	62	1-101-886-00	430	1-102-823-00	0.0082
10	1-102-947-00	68	1-101-888-00	470	1-102-824-00	0.01
11	1-102-948-00	75	1-101-890-00	510	1-101-059-00	0.022
12	1-102-949-00	82	1-102-971-00	560	1-102-115-00	0.047
13	1-102-950-00	91	1-102-972-00	680	1-102-116-00	
15	1-102-951-00	100	1-102-973-00	820	1-102-117-00	
16	1-102-952-00	110	1-102-815-00			
18	1-102-953-00	120	1-102-816-00			
20	1-102-958-00	130	1-101-081-00			

0.001μF = 1,000pF

**CERAMIC (SEMICONDUCTOR) CAPACITORS (A)**

CAP. (μF)	RATING → : Use the high voltage rated one.			
	25 VOLT.	50 VOLT.	25 VOLT.	50 VOLT.
	PART No.	PART No.	PART No.	PART No.
0.001	→	1-161-039-00	0.018	1-161-016-00
0.0012	→	1-161-040-00	0.022	1-161-017-00
0.0015		1-161-041-00	0.027	1-161-018-00
0.0018		1-161-042-00	0.033	1-161-019-00
0.0022		1-161-043-00	0.039	1-161-010-00
0.0027	→	1-161-044-00	0.047	1-161-021-00
0.0033	→	1-161-045-00	0.056	→
0.0039	→	1-161-046-00	0.068	→
0.0047	→	1-161-047-00	0.082	1-161-024-00
0.0056	→	1-161-048-00	0.1	1-161-025-00
0.0068	→	1-161-049-00		
0.0082	1-161-012-00	1-161-050-00		
0.01	1-161-013-00	1-161-051-00		
0.012	→	1-161-052-00		
0.015	1-161-015-00	1-161-053-00		

## MYLAR CAPACITORS (A)

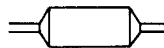
Note: Circled letters (A to Z) are applicable to European models only.

RATING											
CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.	CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.	CAP. (μF)	50 VOLT.	100 VOLT.	200 VOLT.
	PART No.	PART No.	PART No.		PART No.	PART No.	PART No.		PART No.	PART No.	PART No.
0.001	1-108-227-00	1-108-365-00	1-108-409-00	0.01	1-108-239-00	1-108-377-00	1-108-421-00	0.1	1-108-251-00	1-108-389-00	1-108-433-00
0.0012	1-108-351-00	1-108-366-00	1-108-410-00	0.012	1-108-357-00	1-108-378-00	1-108-422-00	0.12	1-108-363-00	1-108-390-00	1-108-434-00
0.0015	1-108-228-00	1-108-367-00	1-108-411-00	0.015	1-108-240-00	1-108-379-00	1-108-423-00	0.15	1-108-252-00	1-108-391-00	1-108-435-00
0.0018	1-108-352-00	1-108-368-00	1-108-412-00	0.018	1-108-358-00	1-108-380-00	1-108-424-00	0.18	1-108-364-00	1-108-392-00	1-108-436-00
0.0022	1-108-230-00	1-108-369-00	1-108-413-00	0.022	1-108-242-00	1-108-381-00	1-108-425-00	0.22	1-108-254-00	1-108-393-00	1-108-437-00
0.0027	1-108-353-00	1-108-370-00	1-108-414-00	0.027	1-108-359-00	1-108-382-00	1-108-426-00	0.27	1-108-854-00	—	—
0.0033	1-108-232-00	1-108-371-00	1-108-415-00	0.033	1-108-244-00	1-108-383-00	1-108-427-00	0.33	1-108-855-00	—	—
0.0039	1-108-354-00	1-108-372-00	1-108-416-00	0.039	1-108-360-00	1-108-384-00	1-108-428-00	0.39	1-108-856-00	—	—
0.0047	1-108-234-00	1-108-373-00	1-108-417-00	0.047	1-108-246-00	1-108-385-00	1-108-429-00	0.47	1-108-857-00	—	—
0.0056	1-108-355-00	1-108-374-00	1-108-418-00	0.056	1-108-361-00	1-108-386-00	1-108-430-00				
0.0068	1-108-237-00	1-108-375-00	1-108-419-00	0.068	1-108-249-00	1-108-387-00	1-108-431-00				
0.0082	1-108-356-00	1-108-376-00	1-108-420-00	0.082	1-108-362-00	1-108-388-00	1-108-432-00				



## TANTALUM CAPACITORS

RATING → : Use the high voltage rated one.							
CAP. (μF)	3.15 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	25 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.01					→	→	1-131-396-00 (B)
0.015					→	→	1-131-397-00 (B)
0.022					→	→	1-131-398-00 (B)
0.033					→	→	1-131-399-00 (B)
0.047					→	→	1-131-400-00 (B)
0.068					→	→	1-131-401-00 (B)
0.1					→	→	1-131-402-00 (B)
0.15					→	→	1-131-403-00 (B)
0.22					→	→	1-131-404-00 (B)
0.33					→	1-131-409-00 (B)	1-131-405-00 (B)
0.47	—	—	—	—	1-131-412-00 (B)	→	1-131-406-00 (B)
0.68	—	—	—	1-131-415-00 (B)	→	1-131-410-00 (B)	1-131-407-00 (B)
1.0	—	—	1-131-418-00 (B)	—	1-131-413-00 (B)	→	1-131-408-00 (B)
1.5	—	1-131-421-00 (B)	—	1-131-416-00 (B)	→	1-131-411-00 (B)	1-131-348-00 (B)
2.2	1-131-424-00 (B)	—	1-131-419-00 (B)	—	1-131-414-00 (B)	1-131-355-00 (B)	1-131-349-00 (B)
3.3	—	1-131-422-00 (B)	—	1-131-417-00 (B)	1-131-362-00 (B)	1-131-356-00 (B)	1-131-350-00 (B)
4.7	1-131-425-00 (B)	—	1-131-420-00 (B)	1-131-369-00 (B)	1-131-363-00 (B)	1-131-357-00 (B)	1-131-351-00 (C)
6.8	—	1-131-423-00 (B)	1-131-376-00 (B)	1-131-370-00 (B)	1-131-364-00 (B)	1-131-358-00 (C)	1-131-352-00 (C)
10	1-131-426-00 (B)	1-131-383-00 (B)	1-131-377-00 (B)	1-131-371-00 (B)	1-131-365-00 (C)	1-131-359-00 (C)	1-131-353-00 (D)
15	1-131-390-00 (B)	1-131-384-00 (B)	1-131-378-00 (B)	1-131-372-00 (B)	1-131-366-00 (C)	1-131-360-00 (D)	—
22	1-131-391-00 (B)	1-131-385-00 (B)	1-131-379-00 (C)	1-131-373-00 (C)	1-131-367-00 (D)		
33	1-131-392-00 (B)	1-131-386-00 (C)	1-131-380-00 (C)	1-131-374-00 (D)			
47	1-131-393-00 (C)	1-131-387-00 (C)	1-131-381-00 (D)	—			
68	1-131-394-00 (B)	1-131-388-00 (C)	—	—			
100	1-131-395-00 (D)	—	—	—			



## TANTALUM CAPACITORS

RATING						
CAP. (μF)	3 VOLT.	6.3 VOLT.	10 VOLT.	16 VOLT.	20 VOLT.	35 VOLT.
	PART No.	PART No.	PART No.	PART No.	PART No.	PART No.
0.033						1-131-273-00 (E)
0.047						1-131-274-00 (E)
0.068						1-131-275-00 (E)
0.1						1-131-276-00 (D)
0.15						1-131-277-00 (D)
0.22			—	—	1-131-262-00 (D)	1-131-278-00 (D)
0.33			—	—	1-131-263-00 (D)	1-131-279-00 (D)
0.47			1-131-169-00 (D)	—	1-131-264-00 (D)	1-131-280-00 (D)
0.68			—	1-131-258-00 (D)	1-131-265-00 (D)	1-131-281-00 (D)
1.0			1-131-254-00 (D)	—	1-131-266-00 (D)	1-131-282-00 (D)
1.5		1-131-250-00 (D)	—	—	1-131-267-00 (D)	1-131-283-00 (E)
2.2		—	—	1-131-259-00 (D)	1-131-268-00 (D)	1-131-284-00 (E)
3.3		—	1-131-255-00 (D)	—	1-131-269-00 (D)	—
4.7		1-131-251-00 (E)	1-131-171-00 (D)	—	1-131-270-00 (D)	—
6.8		—	—	1-131-260-00 (D)	1-131-271-00 (E)	—
10	—	—	1-131-256-00 (D)	—	1-131-272-00 (E)	—
15	—	1-131-252-00 (D)	—	1-131-261-00 (E)		
22	—	—	1-131-257-00 (E)	—		
33	1-131-176-00 (D)	1-131-253-00 (E)	1-131-173-00 (C)	—		
47	1-131-288-00 (F)	1-131-174-00 (D)	—	—		
100	1-131-177-00 (D)	—	—	—		

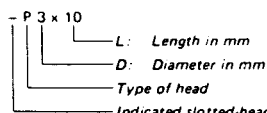
[illegible]

1/4 WATT CARBON RESISTORS <sup>Ⓐ</sup>Note: Circled letter <sup>Ⓐ</sup> is applicable to European models only.

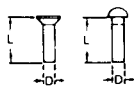
Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.	Ω	Part No.
1.0	1-246-401-00	10	1-246-425-00	100	1-246-449-00	1.0k	1-246-473-00	10k	1-246-497-00	100k	1-246-521-00	1.0M	1-246-545-00
1.1	1-246-402-00	11	1-246-426-00	110	1-246-450-00	1.1k	1-246-474-00	11k	1-246-498-00	110k	1-246-522-00	1.1M	1-210-814-00
1.2	1-246-403-00	12	1-246-427-00	120	1-246-451-00	1.2k	1-246-475-00	12k	1-246-499-00	120k	1-246-523-00	1.2M	1-210-815-00
1.3	1-246-404-00	13	1-246-428-00	130	1-246-452-00	1.3k	1-246-576-00	13k	1-246-500-00	130k	1-246-524-00	1.3M	1-210-816-00
1.5	1-246-405-00	15	1-246-429-00	150	1-246-453-00	1.5k	1-246-577-00	15k	1-246-501-00	150k	1-246-525-00	1.5M	1-210-817-00
1.6	1-246-406-00	16	1-246-430-00	160	1-246-454-00	1.6k	1-246-578-00	16k	1-246-502-00	160k	1-246-526-00	1.6M	1-210-818-00
1.8	1-246-407-00	18	1-246-431-00	180	1-246-455-00	1.8k	1-246-579-00	18k	1-246-503-00	180k	1-246-527-00	1.8M	1-210-819-00
2.0	1-246-408-00	20	1-246-432-00	200	1-246-456-00	2.0k	1-246-580-00	20k	1-246-504-00	200k	1-246-528-00	2.0M	1-210-820-00
2.2	1-246-409-00	22	1-246-433-00	220	1-246-457-00	2.2k	1-246-581-00	22k	1-246-505-00	220k	1-246-529-00	2.2M	1-210-821-00
2.4	1-246-410-00	24	1-246-434-00	240	1-246-458-00	2.4k	1-246-582-00	24k	1-246-506-00	240k	1-246-530-00	2.4M	1-244-754-00
2.7	1-246-411-00	27	1-246-435-00	270	1-246-459-00	2.7k	1-246-583-00	27k	1-246-507-00	270k	1-246-531-00	2.7M	1-244-755-00
3.0	1-246-412-00	30	1-246-436-00	300	1-246-460-00	3.0k	1-246-584-00	30k	1-246-508-00	300k	1-246-532-00	3.0M	1-244-756-00
3.3	1-246-413-00	33	1-246-437-00	330	1-246-461-00	3.3k	1-246-585-00	33k	1-246-509-00	330k	1-246-533-00	3.3M	1-244-757-00
3.6	1-246-414-00	36	1-246-438-00	360	1-246-462-00	3.6k	1-246-586-00	36k	1-246-510-00	360k	1-246-534-00	3.6M	1-244-758-00
3.9	1-246-415-00	39	1-246-439-00	390	1-246-463-00	3.9k	1-246-587-00	39k	1-246-511-00	390k	1-246-535-00	3.9M	1-244-759-00
4.3	1-246-416-00	43	1-246-440-00	430	1-246-464-00	4.3k	1-246-488-00	43k	1-246-512-00	430k	1-246-536-00	4.3M	1-244-760-00
4.7	1-246-417-00	47	1-246-441-00	470	1-246-465-00	4.7k	1-246-489-00	47k	1-246-513-00	470k	1-246-537-00	4.7M	1-244-761-00
5.1	1-246-418-00	51	1-246-442-00	510	1-246-466-00	5.1k	1-246-490-00	51k	1-246-514-00	510k	1-246-538-00	5.1M	1-244-762-00
5.6	1-246-419-00	56	1-246-443-00	560	1-246-467-00	5.6k	1-246-491-00	56k	1-246-515-00	560k	1-246-539-00		
6.2	1-246-420-00	62	1-246-444-00	620	1-246-468-00	6.2k	1-246-492-00	62k	1-246-516-00	620k	1-246-540-00		
6.8	1-246-421-00	68	1-246-445-00	680	1-246-469-00	6.8k	1-246-493-00	68k	1-246-517-00	680k	1-246-541-00		
7.5	1-246-422-00	75	1-246-446-00	750	1-246-470-00	7.5k	1-246-494-00	75k	1-246-518-00	750k	1-246-542-00		
8.2	1-246-423-00	82	1-246-447-00	820	1-246-471-00	8.2k	1-246-495-00	82k	1-246-519-00	820k	1-246-543-00		
9.1	1-246-424-00	91	1-246-448-00	910	1-246-472-00	9.1k	1-246-496-00	91k	1-246-520-00	910k	1-246-544-00		

## HARDWARE NOMENCLATURE

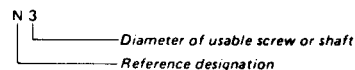
Screw:



Unless otherwise indicated, it means cross-recessed head (Phillips type).



Nut, Washer, Retaining ring:



Reference Designation	Shape	Description	Remarks
<b>SCREWS</b>			
P		pan-head screw	binding-head (B) screw for replacement
PWH		pan-head screw with washer face	binding-head (B) screw and flat washer for replacement
PS PSP		pan-head screw with spring washer	binding-head (B) screw and spring washer for replacement
PSW PSPW		pan-head screw with spring and flat washers	binding-head (B) screw and spring and flat washers for replacement
R		round-head screw	binding-head (B) screw for replacement
K		flat-countersunk-head screw	
RK		oval-countersunk-head screw	
B		binding-head screw	
T		truss-head screw	binding-head (B) screw for replacement
F		flat-fillister-head screw	
RF		fillister-head screw	
BV		braizer-head screw	

Reference Designation	Shape	Description	Remarks
<b>SELF-TAPPING SCREWS</b>			
TA		self-tapping screw	ex: TA, P 3 x 10
PTP		pan-head self-tapping screw	binding-head self-tapping (TA, B) screw for replacement
PTPWH		pan-head self-tapping screw with washer face	binding-head self-tapping (TA, B) screw and flat washer for replacement
PTTWH		pan-head thread-rolling screw with washer face	binding-head (B) screw and flat washer for replacement
<b>SET SCREWS</b>			
SC		set screw	
SC		hexagon-socket set screw	ex: SC 2.6 x 4, hexagon socket
<b>NUT</b>			
N		nut	
<b>WASHERS</b>			
W		flat washer	
SW		spring washer	
LW		internal-tooth lock washer	ex: LW3, internal
LW		external-tooth lock washer	ex: LW3, external
<b>RETAINING RINGS</b>			
E		retaining ring	
G		grip-type retaining ring	